

REMARKS

The present response is intended to be fully responsive to all points of rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Claims 1-47 are pending in this case. Claims 1-47 are subject to restriction and/or election requirement. Claims 1-11, 21, 27, 30, 37, 39, 44 and 46 have been rejected under 35 U.S.C. § 112, first paragraph. Claims 8, 18, 30 and 46 have been rejected under 35 U.S.C. § 112, second paragraph. Claims 1-2, 10-11 have been rejected under 35 U.S.C. § 102(c). Claims 3-6, 8, 9, 16-22, 34-47 have been rejected under 35 U.S.C. § 103(a). Claims 23-26, 28-29, 32-33 have been allowed. Independent claims 1, 16, 23, 34 and 39 and dependent claims 8, 18, 21, 30, 37, 46 have been amended. Claims 12-15 have been withdrawn as being drawn to a non-elected invention.

Affirmation of Election

Examiner has restricted the present application under 35 USC 121. Applicant hereby affirms the provisional election made without traverse on December 30, 2003 to prosecute the invention I on claims 1-11, 16-47. Claims 12-15 have been withdrawn as being drawn to a non-elected invention. Applicant notes that confirmation of election was previously made in a reply submitted January 5, 2004.

Response to Drawing Objections

The Examiner indicated that Figures 1A, 1B, 1C and 1D should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. In response, Applicant submits corrected Figures 1A, 1B, 1C and 1D having the --Prior Art-- designations.

Response to Objection to the Specification

The Examiner objected to the disclosure because of several formalities. Applicants have amended the specification to correct these informalities. No new matter has been added.

Response to Objection to the Claims

The Examiner objected to the claims because of several formalities. Applicants have amended the claims to correct these informalities.

Response to 35 U.S.C. § 112, First Paragraph Rejections

The Examiner rejected claims 1-11, 21, 27, 30, 37, 39, 44 and 46 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The specific subject matter rejected is described and addressed below.

The Examiner indicated that the specification inadequately defines how one would enable "maintaining synchronization...when the synchronization signal is not transmitted" in lines 10-11 of claims 1, 21, 37. In response, Applicant submits that the method of synchronization among nodes is adequately described in the specification. As described in the specification, a feature of the present invention is that nodes that are able to hear one another can synchronize by each node transmitting synchronization signal within a frame on a random basis. A node that hears another node's synchronization signal will align its internal clock to that received signal. Thus, a node decides on a random basis whether to transmit a synchronization signal within a frame. During times when a node does not transmit the synchronization signal, it listens to the media and tries to detect synchronization signals transmitted by other nodes. It is during this listening period that a node will detect the presence of other nodes' synchronization signal. This method is described in detail in the specification at page 16, line 18 through page 17, line 4 with reference to Figure 6.

The Examiner also indicated that the specification inadequately defines how one would enable communication between nodes if "each node is adapted to transmit a different bi-phase sequence" in claims 5, 27, 44. In response, Applicant submits that the method of enabling communication between nodes when each node is adapted to transmit different bi-phase sequence is adequately described in the specification. As described in detail in the specification page 15, lines 1-17, use of different bi-phase sequences is intended to provide collision resistance. The use of bi-phase signals prevents the cancellation of simultaneous transmissions by several nodes. Thus, even if several nodes transmit at the same time, they will not cancel each other and that any node that can hear at least one of the transmitting nodes will be able to detect the presence of the transmitted signal.

The Examiner further indicated that the specification inadequately defines how one would enable "selecting a number at random and deciding to transmit said synchronization signal if the number selected is greater than a predetermined amount chosen in accordance with a desired duty cycle" in lines 2-4 of claims 8, 30, 46. The Examiner indicated that it appears that lines 22-28 of page 16 in the specification are intended to define these claims but are written in a way that does not provide a clear understanding. In response, Applicant submits that the method of randomly determining whether to transmit a synchronization signal during any particular frame is adequately

described in the specification. The paragraph beginning on page 16, line 18 has been amended to better clarify how the nodes decides on a random basis whether to transmit the synchronization signal in any particular frame. In the illustration provided, a number between zero and one is selected at random. If the random number generated is less than a predetermined threshold number selected between zero and one than the decision to transmit is made. If the random number generated is greater than or equal to than the predetermined threshold number, than the decision not to transmit is made. The threshold number chosen therefore determines the duty cycle at which the synchronization signal is transmitted. For example, a threshold number of 0.35 corresponds to a duty cycle of 35%.

Lastly, the Examiner indicated that the specification inadequately defines now one would enable a node for "deriving timing from synchronization signals from other nodes" with "each node inserting a synchronization signal" in claim 39. In response, Applicant submits that this feature is adequately described in the specification. Specifically, this feature is described in detail in the specification on page 18, line 4 through page 19, line 19 and in Figures 7-9. The specification and figures describe how the synchronization timing of two disparate groups of nodes (i.e. groups of nodes that cannot hear each other) that share the same media are able to be converged so that all groups share a common synchronization timing. As described, this is achieved by generating a skewed synchronization signal that is shifted towards a converged timing that takes into account all the groups a node hears. This synchronization signal is heard by nodes in other groups who in response, adjust their internal clocks accordingly. If the timing of the disparate groups are far enough away from each other, then a middle node is operative to transmit multiple synchronization signals skewed such that over time, the timing of all groups eventually converge into a single timing.

Based on the reasons stated above, Applicant believes that amended claims 1-11, 21, 27, 30, 37, 39, 44 and 46 overcome the Examiner's rejection based on § 112, first paragraph grounds. The Examiner is respectfully requested to withdraw the § 112, first paragraph rejection.

Response to 35 U.S.C. § 112, Second Paragraph Rejections

The Examiner rejected claims 8, 30, 46 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Regarding claims 8, 30 and 46 Applicant has amended these claims to clarify the process of generating a random number, comparing this number with a predetermined threshold number and

deciding whether to transmit a synchronization signal within a particular frame based on the output of the comparison.

Regarding claim 18, Applicant has amended this claim to clarify the language thus providing sufficient antecedent basis for the application processor limitation in the claim.

Amended claims 8, 18, 30, 46 now feature language which make it clear what the subject matter is that the Applicant regards as the invention. Applicant believes that amended claims 8, 18, 30, 46 overcome the Examiner's rejection based on § 112, second paragraph grounds. The Examiner is respectfully requested to withdraw the § 112, second paragraph rejection.

Response to 35 U.S.C. § 102(c) Rejections

The Examiner rejected claims 1-2, 10-11 under 35 U.S.C. § 103(a) ^{re} as being unpatentable over U.S. Patent No. 5,974,056 ("Wilson"). Applicants respectfully submit that the prior art fails to disclose or suggest at least the step of randomly transmitting, on a frame by frame basis, synchronization signals onto the media within a synchronization time slot of a frame. Therefore, Applicants respectfully traverse the rejections and request favorable reconsideration.

While continuing to traverse the Examiner's rejections, Applicant, in order to expedite the prosecution, has chosen to clarify and emphasize the crucial distinctions between the present invention and the devices of the patents cited by the Examiner. Specifically, claim 1 has been amended to include a method of synchronization between a plurality of nodes connected to a media, each node including a clock, the method comprising the steps of listening to the media for a predetermined length of time while attempting to detect synchronization signals from other nodes, if synchronization signals are detected, deriving a timing signal from the synchronization signals, aligning the clock in a particular node in accordance with the timing signal, randomly transmitting, on a frame by frame basis, synchronization signals onto the media within a synchronization time slot, maintaining synchronization with other nodes by listening to the media for synchronization signals transmitted by other nodes when the synchronization signal is not transmitted during the specific points in time and detecting synchronization signals transmitted by other nodes and if synchronization signals are not detected, randomly transmitting, on a frame by frame basis, synchronization pulses onto the media within the synchronization time slot and waiting for other nodes to join the network.

Wilson teaches a method and apparatus for transmission of data for voice, signaling data, air traffic control facilities, telephone equipment, communication systems, etc., wherein the data is transmitted in the form of data packets comprising a preamble, header, data and/or signal bytes via a

dual bus between decentralized stations connected to the bus, wherein the stations receive the data for transmission from connected peripheral devices and the stations transmit received data via these peripheral units, and wherein the station clock pulse is synchronized by a synchronizing signal transmitted from a master station.

The method of Wilson is operative to select a master station from among the stations connected to the bus. The master station sends a start packet to the bus in order to synchronize the stations and sets via this synchronizing signal the station clock or defines the beginning of transmission for the individual stations.

In contrast, the method of the present invention does not select a master station. Rather than use a centralized synchronization scheme as in Wilson, the nodes in a shared media network of the present invention align their internal clocks using a distributed synchronization scheme. Each node in the network is adapted to randomly transmit, on a frame by frame basis, a synchronization signal within a synchronization time slot within the frame. During times that a node does not transmit this signal, it listens to the media for the signals of other nodes. The node then adjusts its internal clock based on the signals received from other nodes. This feature is neither taught nor suggested by Wilson.

It is believed that Wilson does not anticipate all the claim limitations of independent claim 1 and thus overcomes the Examiner's § 102(c) rejection based on the Wilson reference. Because Wilson does not anticipate or suggest claim 1, then dependent claims 2, 10-11 are allowable as well. The Examiner is respectfully requested to withdraw the rejection based on § 102(c).

Response to 35 U.S.C. § 103(a) Rejections

The Examiner rejected claims 3-6, 8-9, 16-22, 34-47 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,974,056 ("Wilson") in view of U.S. Patent No. 6,667,284 ("Yonge"). Applicants respectfully submit that the prior art fails to disclose or suggest at least the step of randomly transmitting, on a frame by frame basis, synchronization signals onto the media within a synchronization time slot of a frame. Therefore, Applicants respectfully traverse the rejections and request favorable reconsideration.

Yonge teaches a MAC scheme for network stations operating in an OFDM transmission network. The MAC scheme uses robustly transmitted frame control information to ensure network synchronization and convey channel access prioritization for QoS. Frame control information can occur in a frame before and after the frame's payload, or in a response.

Regarding claims 3-6, 8-9, it is submitted that in light of the arguments made above, claim 1 is not anticipated by Wilson. Further, neither Wilson nor Yonge alone or in combination teach or suggest the step of randomly transmitting, on a frame by frame basis, synchronization signals onto the media within a synchronization time slot of a frame. Therefore, Applicants respectfully traverse the rejection of dependent claims 3-6, 8-9 and submit that the presently claimed invention are patently distinct over Wilson in view of Yonge. The Examiner is respectfully requested to withdraw the rejection based on 35 U.S.C. §103(a).

Regarding claims 16-22, 34-47, it is submitted that in light of the arguments made above, neither Wilson nor Yonge alone or in combination teach or suggest the step of randomly transmitting, on a frame by frame basis, synchronization signals onto the media within a synchronization time slot of a frame. Wilson does teach a method of determining the order of the individual stations along the bus wherein the stations may be arranged along a bus in one of several ways: (1) depending on their serial number, (2) depending on identification numbers assigned to them, (3) depending on randomly assigned, but different large numbers, or (4) depending on their sequence or physical order. This, however, has no connection whatsoever with the present invention scheme of randomly transmitting on a frame by frame basis a synchronization signal within a synchronization time slot of a frame.

Therefore, Applicants respectfully traverse the rejection of independent claims 16, 34, 39 and submit that the presently claimed invention are patently distinct over Wilson in view of Yonge. Because Wilson and Yonge do not anticipate or suggest claims 16, 34, 39 as discussed above, then claims 17-22, 35-38, 40-47 are allowable as well. The Applicant respectfully traverses the objections of claims 16-22, 34-47 and submits that the presently claimed invention is patently distinct over Wilson in view of Yonge. The Examiner is respectfully requested to withdraw the rejection based on 35 U.S.C. §103(a).

Correction of Typographical Errors

Amendments haven been made to correct grammatical and usage errors in the specification. No new matter has been added to the application by these amendments.

Conclusion

In view of the above amendments and remarks, it is respectfully submitted that independent claims 1, 16, 23, 34 and 39 and hence dependent claims 2-11, 17-22, 24-33, 35-38, 40-47 are now in condition for allowance. Prompt notice of allowance is respectfully solicited.

In light of the Amendments and the arguments set forth above, Applicants earnestly believe that they are entitled to a letters patent, and respectively solicit the Examiner to expedite prosecution of this patent applications to issuance. Should the Examiner have any questions, the Examiner is encouraged to telephone the undersigned.

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Respectfully submitted,



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